Clearing Desktop Report – CPS 818

We're working for Western Australia.

Bridgetown Boyup Brook Rd 2.85 - 29.32 SLK Low Cost Shoulder Sealing

December 2021

EOS 2524

D21#1220252

Contents

Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Contractor Environment	Rev0	30/11/2021
Reviewer:	Senior Environment Officer	Rev 0	15/12/2021
Updated:	Contractor Environment	Rev 1	1/02/2022

1 PURPOSE

This Clearing Desktop Report (CDR) is a desktop assessment of native vegetation clearing that is proposed to be cleared using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

2 SCOPE

2.1 Project Scope

Project Name: Bridgetown Boyup Brook Rd (M006) Low Cost Shoulder Sealing (LCSS) (2.85 – SLK 29.32 SLK), between Bridgetown and Boyup Brook, within the Shire of Bridgetown Greenbushes and Boyup Brook.

Project Purpose / Components: The Scope of works for the LCSS works will vary in width between 0.5 to 2.5 metres and delivered under the following road maintenance tasks:

- Culvert extensions within the road maintenance zone/ previously disturbed areas.
- Road shoulder material tyne and top up
- Road shoulder material boxed out and replaced
- Roadside drains cleaned and reshaped
- Pavement widening sealed to the hinge point
- Kerbing installation

- **The proposed clearing under CPS 818 is :** 0.33 ha.
  Clearing areas are detailed in TRIM D21#1171325 Proposed clearing locations

The proposed temporary clearing under CPS 818 is: 0 ha.

Project Location(s): The project area is located on Bridgetown Boyup Brook Rd (M006) (2.85 – SLK 29.32 SLK) as shown in Figure 1.

- MGA reference: Start E4219854 S6243838, Finish E442930 S6255510

2.2 Desktop Assessment Scope

The assessment area is confined to a local area of a 10 km radius, as shown in Figure 2.

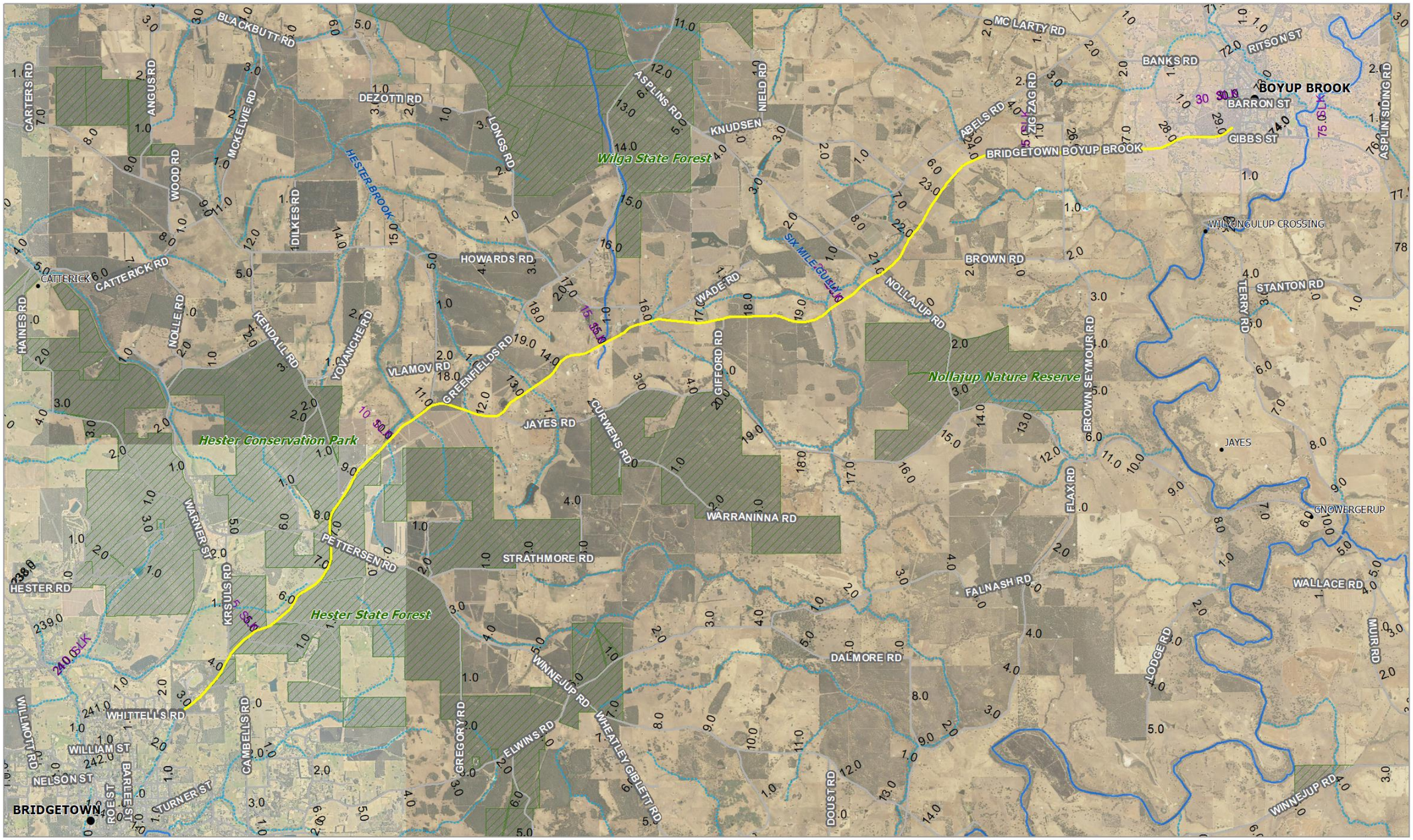


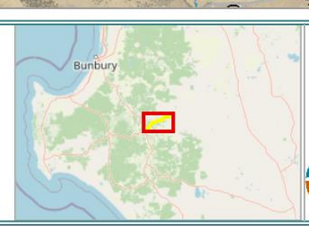
FIGURE 1. PROJECT AREA

BRIDGETOWN BOYUP BROOK ROAD 2.85 - 29.32 SLK

Ref: BridgetownBoyupBrook_Clearing Locality
Date: 16/11/2021 Author: SP

Bridgetown Boyup Brook Rd 2.85 - 29.32 SLK
Road
Major watercourse
Minor drainage line
DBCA managed land

Source: Base map © Esri and its data suppliers, SLIP Landgate (2021)



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GRID: GDA zone 50
N

mainroads WESTERN AUSTRALIA

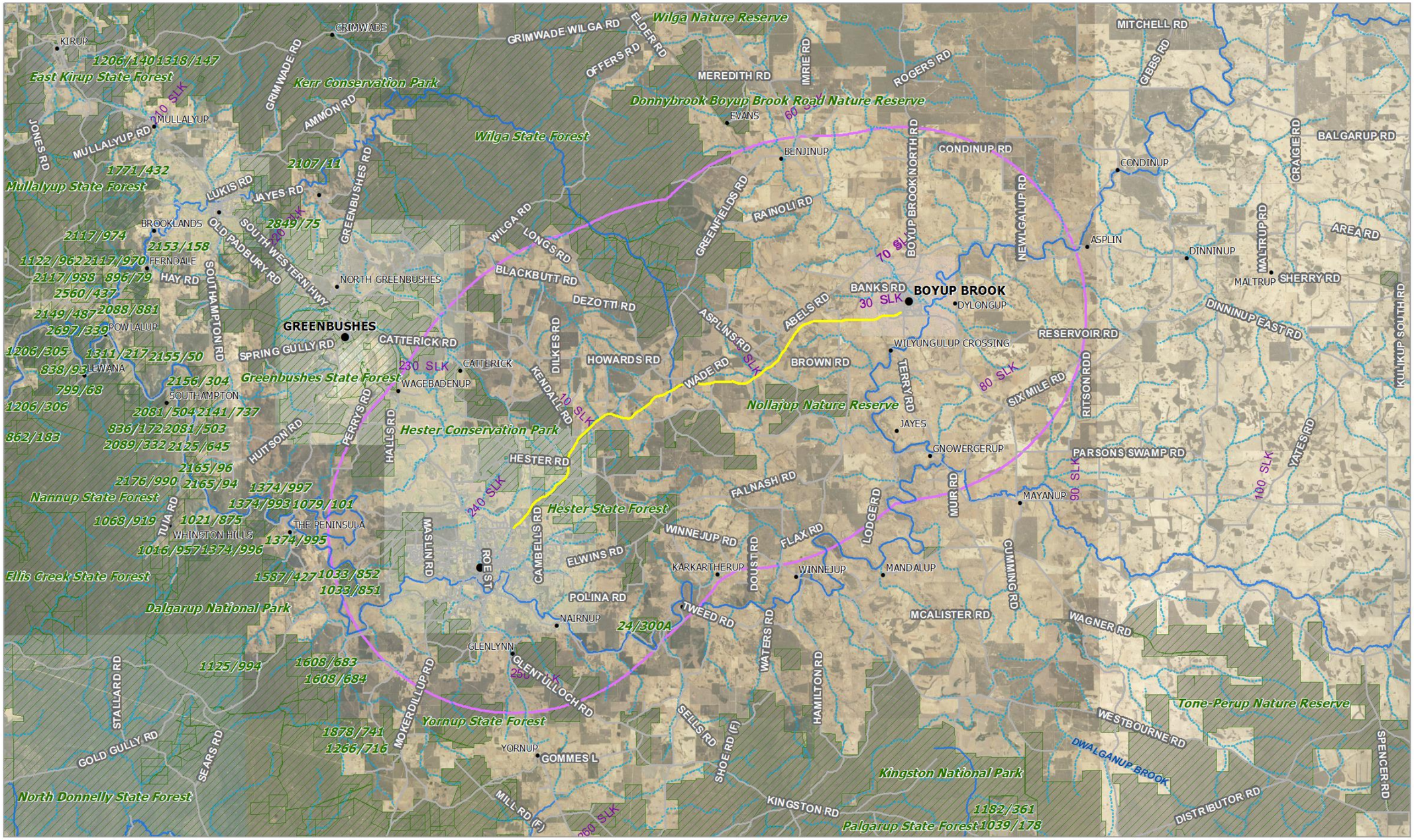

FIGURE 2. PROJECT LOCATION AND STUDY AREA

BRIDGETOWN BOYUP BROOK ROAD 2.85 - 29.32 SLK

Ref: BridgetownBoyupBrook_Clearing Locality
Date: 16/11/2021 Author: SP

Bridgetown Boyup Brook Rd 2.85 - 29.32 SLK
DBCA managed land
Road
Major watercourse
Minor drainage line
Locality 10km

Source: Base map © Esri and its data suppliers. SLIP Landgate (2021)

A3 @ 1:190000
0 0.5 1 2 km
GRID: GDA zone 50
N

mainroads WESTERN AUSTRALIA

2.3 Alternatives to Clearing

No alternatives have been proposed. The project includes the minimum impacts possible to achieve the road safety outcomes required.

2.4 Measures to Avoid, Minimise, Mitigate and Manage Project Clearing Impacts

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in Table 1.

Alternative options to the proposed works were limited without sacrificing road safety outcomes or not meeting appropriate design requirements and due to property restrictions. The current project design has been developed with a focus on road safety while avoiding, minimising, mitigating and managing clearing impacts. Incorporated measures to minimise environmental impact include:

- Completed baseline black cockatoo survey, vegetation mapping and several follow up site investigations to identify constraints and opportunities to minimise potential impacts during project design.
- Absolutely minimised clearing impacts and limited to individual or small groups of trees with vast majority of road verge vegetation to be retained.
- Considered the minimal extent of vegetation clearing required to construct the road infrastructure. Included design measures such as using existing clearings, steepening batters, narrowing/realigning the road to avoid clearing, extending and stabilising outfalls.
- The clearing area will be demarcated on site prior to construction activities commencing and prior to the clearing of native vegetation to avoid accidental clearing.
- The site office, materials storage areas, construction vehicles/machinery parking will be located at an existing cleared, hardstand area.
- No temporary clearing will be required.

Refer to Appendix 1 Clearing locations (D21#1171325)

Table 1. Justification of Avoiding, Minimising, Mitigating and Managing Project Clearing Impacts

Steepen batter slopes	Due to the traffic volumes, vehicle type and posted speeds, batters cannot be changed significantly. One section of road however between SLK 28.00 to 28.60 LHS has proposed batter additions proposed due to the existing steep slope (1:2). By achieving this the project does not require safety barrier. Cut and fill process will be used, and will decrease the likelihood of scouring and improves road runoff safety. 1:3 slope also improves the longevity of the batter.  
Installation of safety barriers	No safety barriers to be introduced within this section of works.
Alignment to one side of existing road	Widening the seal on one side of the road cannot be implemented due to the nature of the project involving seal widening on both sides of the road to achieve safety outcomes, with the existing road alignment central to widening.
Alternative alignment to follow existing road (or) to preferentially locate	As above seal widening on both sides of the road is required to achieve safety outcomes, with the existing road alignment central to widening.

within pasture or a degraded areas	
Installation of kerbing	Kerbing will be used in areas where there is not enough room for a table drain. Trees will then be able to remain in place and not removed. Kerbing will also be used at intersections, to stop customers cutting the corners causing shoulder wear/potholes, and in certain places where scouring has occurred, to direct water into offshoots with rock protection.
Simplification of design to reduce number of lanes and/or complexity of intersections	Not applicable.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Stockpiles would be an ongoing need for this project and future reseal works. Stockpile sites are planned for 7.70, 25.89 and 29.00 SLK within existing cleared hardstand areas.
Drainage modification	Culvert extensions throughout this section of road will improve safety and flow of water more directed away from the road and shoulder and into the existing bushland or existing water ways. Some trees and shrubs currently reduce flow and create a debris build up causing scouring or water on road issues. Existing shallow drains also create water on road issues and scoring of the shoulders. Improving the drainage and installation of rock protection will limit the amount of silt ending up in waterways. Deepening of existing drains will also limit tree debris (leaves and sticks) from blocking V drains and create a better, more constant flow of water.

2.5 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.3), Main Roads has also had regard to

EPPs

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992;
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011

Relevant other policies and guidance documents:

- The Western Australian Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DWER, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, August 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice - EPA

Other Legislation of relevance for assessment of clearing and planning/other matters

- Biodiversity Conservation Act 2016 (WA) (BC Act)
- Conservation and Land Management Act 1984 (WA) (CALM Act)
- Country Areas Water Supply Act 1947 (WA) (CAWS Act)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)
- Planning and Development Act 2005 (WA) (P&D Act)
- Soil and Land Conservation Act 1945 (WA)
- Rights in Water and Irrigation Act 1914
- Aboriginal Heritage Act 1972 (WA)
- Town Planning and Development Act 1928

3 Methodology

3.1 Desktop Study

A desktop assessment of the project area and an assessment of native vegetation clearing were undertaken by reviewing a number of government agency managed databases, viewing GIS shapefiles and consulting with relevant stakeholders where necessary. Results from searches can be found in Appendix 2.

GIS layer viewing and mapping is done using ArcMap. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, these are referenced in Section 7.

4 VEGETATION DETAILS

4.1.1 Project Site Vegetation Description

Vegetation within the survey area was in a completely degraded to degraded condition (EPA 2016) present as narrow roadside remnants or paddock trees over a mostly cleared understorey. Trees within the survey area consisted of Marri (*Corymbia calophylla*) or Jarrah (*Eucalyptus marginata*) in the upland areas and Flooded Gum (*Eucalyptus rudis*) mostly along the drainage lines and low areas. Many of the Marri were heavily affected by Marri canker.

Tables 3 and 4 provide details of the Pre-European Vegetation Associations and Complexes within the project area and the remaining extents of these associations. The EPA and national objectives and targets for biodiversity conservation have targets to prevent clearance of ecological communities with an extent below 30% of pre-European levels and to be reserved at over 10% (EPA 2000, Commonwealth of Australia 2001). Associations or Complexes at under 10% remaining are considered endangered.

For a full description of the proposed impacts and vegetation at each location, refer to the Site Inspection Report in TRIM D21#888965.

Table 2. Summary of Project Area's Mapped Pre-European Vegetation Associations (Government of Western Australia, 2019)

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association Bridgetown 3 described as a Medium forest: jarrah-marri	Clearing of up to 0.33 ha	Degraded to Completely degraded (EPA 2016)	Vegetation description and condition determined from Main Roads site visits Oct and Nov 2021 and aerial imagery.
Vegetation Association Bridgetown 992 Medium forest; jarrah and wandoo (Eucalyptus wandoo)			

Table 3. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 3	**Statewide**	2,661,404.62	1,803,437.48	67.76	55.23
	IBRA Bioregion Jarrah Forest	2,390,591.54	1,604,101.56	67.10	54.35
	IBRA Sub-region Southern Jarrah Forest JF2	1,482,491.85	880,655.65	59.40	46.63
	Local Government Authority Shire of Bridgetown Greenbushes	121,152.70	68,275.41	56.35	48.90
	Shire of Boyup Brook	154,521.67	85,935.62	154,521.67	35.35
Veg Assoc No. 992	**Statewide**	122,048.81	28,492.05	23.34	2.71
	IBRA Bioregion Jarrah Forest	121,369.73	27,814.28	22.92	2.16
	IBRA Sub-region Southern Jarrah Forest JF2	108,767.95	24,532.31	22.55	2.20
	Local Government Authority Shire of Bridgetown Greenbushes	9,631.26	1,553.61	16.13	2.30
	Shire of Boyup Brook	72,992.48	16,755.66	22.96	2.59

4.1.2 Vegetation Complexes and Representation

Table 4. Vegetation Complexes (Heddle/Mattiske) within the Project Area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2019 Vegetation Extent	% Remaining
Catterick, CC1	27,385.55	16,733.59	61.10
Dalmore, DMg	1,437.41	120.18	8.36
Dalmore 1, DM1	7,433.54	2,094.79	28.18
Dwellingup, D1	208,490.90	181,038.81	86.83
Lukin 1, LK1	5,223.91	1,332.15	25.50
Newgalup 1, NW1	6,314.85	1,163.61	18.43
Newgalup 1, NWg1	20,694.15	3,091.92	14.94
Wilga, WG	38,161.73	25,542.24	66.93
Wingewelup, Wg	2,698.54	993.92	36.83

5 Assessment Against the Ten Clearing Principles

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten Clearing Principles (*Environmental Protection Act 1986* (EP Act), Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation'

The proposed clearing is not likely to be at variance with the 10 Clearing Principles.

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Proposed clearing is not likely to be at **variance to this Principle.**

Naturemap and Protected Matters Search Tool reports were generated on 16/11/2021 (Appendix 2; TRIM D21#1171145). Several Priority or Specially Protected fauna and flora may occur locally. A search of Main Roads database did not identify any priority flora or ecological communities within the road verge 2.85 – 29.32 SLK.
The following significant fauna, flora and communities occur in the wider desktop study area:

Priority fauna

- *Cacatua pastinator subsp. pastinator (Muir's Corella, Muir's Corella (Western Corella SW WA)) S*
- *Ctenotus delli (Dell's skink, Darling Range southwest Ctenotus) P4*
- *Falco peregrinus (Peregrine Falcon) S*
- *Hydromys chrysogaster (Water-rat, Rakali) P4*
- *Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider) P3*
- *Ninox connivens subsp. connivens (Barking owl (southwest subpop.)) P3*
- *Notamacropus irma (Western Brush Wallaby) P4*
- *Phascogale calura (Red-tailed Phascogale, Kenngoor) S*
- *Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale,Wambenger) S*
- *Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest)) P3*

Priority flora

- *Acacia parkerae P3*
- *Caladenia perangusta P2*
- *Caladenia validinervia P1*
- *Calochilus sp. Boyup Brook (E. Chapman s.n. 12/10/2002) P1*
- *Carex tereticaulis P3*
- *Dampiera heteroptera P3*
- *Grevillea ripicola (Collie Grevillea) P4*
- *Ornduffia submersa P4*
- *Thysanotus gageoides P3*
- *Wurmbea sp. Cranbrook (A.R. Annels 3819) P3*

Priority ecological community

- P2 Alluvial soils of the upper Blackwood River (over eight kilometres away to the east) – no impacts proposed.

Given the isolated nature of clearing vegetation that is in a degraded to completely degraded condition or individual trees (none with hollows), the project is unlikely to impact any Priority fauna. Water Rat will not be impacted if it does occur due to culvert works only requiring minor extensions and flows being maintained.

Swan Coastal Plain shield-backed trapdoor spider (*Idiosoma sigillatum*) is harder to de-risk. Burrows of *I. sigillatum* however usually occur in Banksia woodland and heathland on sandy soils (Rix et al. 2018), which to not occur at the site.

No ESAs overlap the project area.

The proposal is not likely to be at **variance to this Principle.**

Methodology
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)
Naturemap (TRIM D21#1171145)
Protected Matters Search Tool (TRIM D21#1171145).
Rix et al. (2018)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Proposed clearing is not likely to be at **variance to this Principle.**

Comments
The following significant fauna occur in the wider desktop study area:

- *Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong) T*
- *Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo - FRTBC) T*
- *Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo) T*
- *Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo) T*
- *Dasyurus geoffroii (Chuditch, Western Quoll) T*
- *Lewinia pectoralis subsp. clelandi (Western Australian Lewin's rail, Lewin's rail (western)) X*
- *Macrotis lagotis (Bilby, Dalgyte, Ninu) T*
- *Myrmecobius fasciatus (Numbat, Walpurti) T*
- *Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir) T*
- *Westralunio carteri (Carter's Freshwater Mussel) T*

A Draft Black Cockatoo Assessment was prepared by SW Environmental for the clearing areas (TRIM D21#1152101). Results are summarised below:

- Desktop surveys identified that all three black cockatoo species have been recorded locally. There are extensive areas of native vegetation and DBCA reserves within six kilometres of the survey area that would provide black cockatoo breeding and foraging resources.
- The survey area contained native vegetation (Flooded Gum, Marri and Jarrah) as mostly paddock trees or small stands. The species present are typically utilised by all three cockatoo species, though only FRTBC was observed during fieldwork.
- None of the trees within the survey area contained hollows. Of the 59 trees assessed, 18 trees were classed as suitable DBH trees. The survey area does not provide any current black cockatoo breeding habitat. Medium to longer term breeding opportunities are also limited due the low number of large trees that may develop suitable breeding hollows and the prevalence of Marri canker.
- Approximately 0.18 ha of quality foraging habitat occurs within the survey area. Given the availability of similar or better quality habitat both within the remaining areas of road reserve and within locally mapped native vegetation and DBCA reserves, this area of foraging habitat is of low significance.
- No roost sites were observed in the survey area.

The proposal is not likely to be at **variance to this Principle.**

Methodology
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)
Naturemap (TRIM D21#1171145)
Protected Matters Search Tool (TRIM D21#1171145).

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Proposal is not likely to be at **variance to this Principle.**

Comments
The database searches identified the following rare flora species within 10 km of the project (Naturemap TRIM D21#1171145):

- *Acacia aphylla (Leafless Rock Wattle) T*
- *Caladenia dorrienii* (Cossack Spider-orchid) *T*
- *Commersonia erythrogyna T*
- *Diuris drummondii (Tall Donkey Orchid) T*

The PMST report also identified that the following Threatened flora that may occur locally (TRIM D21#1171145):

- *Caladenia christineae (Christine's Spider) T*
- *Caladenia harringtoniae (Harrington's Spider-orchid, Pink Spider-orchid) T*
- *Caladenia hoffmanii (Hoffman's Spider-orchid) T*
- *Diuris micrantha (Dwarf Bee-orchid) T*
- *Eleocharis keigheryi (Keighery's Eleocharis) T*

The closest threatened flora records in the Main Roads database are mapped near Boyup Brook in adjacent lands, however the proposed clearing is over 850m from the closest threatened flora record. Flora surveys have not been carried out for the project. However, no orchids were observed during the spring field visits by Main Roads personnel. The closest *Eleocharis* record is east of Boyup Brook. Given the degraded to completely degraded condition to the cleared and selective clearing proposed it is considered highly unlikely than any threatened flora will be impacted.

The proposal is not likely to be at **variance to this Principle.**

Methodology
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)
Naturemap (TRIM D21#1171145)
Protected Matters Search Tool (TRIM D21#1171145).

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Proposed clearing is not at **variance to this Principle.**
Vegetation within the survey area was in a completely degraded to degraded condition (EPA 2016). There are no TECs mapped locally in the Main Roads' shapefiles. **The proposal is** not likely to be at **variance to this Principle.**
Methodology Main Roads GIS Shapefiles Main Roads Site Inspection (20/10/2021) Naturemap (TRIM D21#1171145)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Proposed clearing is not likely to be at **variance to this Principle**

Comments

The EPA and national objectives and targets for biodiversity conservation have targets to prevent clearance of ecological communities with an extent below 30% of pre-European levels and to be reserved at over 10% (EPA 2000, Commonwealth of Australia 2001). Vegetation representation is presented in Tables 3 to 5.

Vegetation Association 3 is well represented at all scales and considered adequately reserved (table below). Vegetation Association 992 is under-represented at all scales and under reserved (table below). The proposed clearing will be carried out in Vegetation Complexes that are well represented (CC1, D1, WG, Wg) and under-represented (DMg, DM1, LK1, NW1, NWg1) (table below).

Of the under-represented vegetation, Association 992 and DM1, LK1, NW1 and NWg1 are mapped in the Native Vegetation Extent (NVE) (DPIRD 2020) dataset. The NVE data layer maps representative vegetation used to calculate the vegetation representation statistics referred to in the tables below. The vegetation clearing proposed will be of a very minor scale, including the clearing of individual trees or small pockets in a degraded to completely degraded condition (EPA 2016). Due to the poor condition, they are no longer considered representative of these Vegetation Associations or Complexes. No clearing of vegetation in a good or better condition will be required, nor are any of the patches being cleared considered significant as a remnant of native vegetation.

Based on the above the proposed clearing is not likely **to be at variance to this Principle.**

Summary of Project Area's Mapped Pre-European Vegetation Associations

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 3	**Statewide**	2,661,404.62	1,803,437.48	67.76	55.23
	IBRA Bioregion Jarrah Forest	2,390,591.54	1,604,101.56	67.10	54.35
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	IBRA Sub-region Southern Jarrah Forest JF2	108,767.95	24,532.31	22.55	2.20
	Local Government Authority Shire of Bridgetown Greenbushes	9,631.26	1,553.61	16.13	2.30
	Shire of Boyup Brook	72,992.48	16,755.66	22.96	2.59

Pre-European Vegetation Representation

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2019 Vegetation Extent	% Remaining
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Dalmore, DMg	1,437.41	120.18	8.36
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Lukin 1, LK1	5,223.91	1,332.15	25.50
Newgalup 1, NW1	6,314.85	1,163.61	18.43
Newgalup 1, NWg1	20,694.15	3,091.92	14.94
Wilga, WG	38,161.73	25,542.24	66.93
Wingewelup, Wg	2,698.54	993.92	36.83

Methodology

Aerial photography
EPA (2016)
Government of Western Australia (2019a,b)
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is not likely to be at **variance to this Principle**

Comments

The term 'wetlands' refers to damplands, estuary-peripheral and water body, floodplains, palusplain and sumplands. There are no wetlands associated with the footprint (SLIP 2020). There are no nearby Geomorphic Wetlands mapped in DBCA datasets.

Several minor culvert extensions will be required within low areas or minor non-perennial watercourses. Generally the works will not impact on any wetland vegetation given the minor extent and degraded nature of vegetation within the project area. Clearing within drainage lines will be restricted to several Flooded gums and a small area of tea tree within mapped drainage lines, with minor clearing drainage crossings or dpressions at 10.68, 13.36, 19.8, 20.59 SLK required. The clearing will be well under 0.5 ha (Part II (6) of the CPS818).

The proposed clearing is not likely to be **at variance to this Principle.**

Methodology

Aerial photography
EPA (2016)
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Proposed clearing is not likely to be at **variance to this Principle**

No declared pest plants under the *Biosecurity and Agriculture Management Act 2007*, were observed during the Main Roads site visit. Weeds will be managed generally through Main Roads CEMP.

The project is not located within any ASS risk areas mapped by the Government of Western Australia (SLIP 2021). ASS may occur at localised areas such as culvert extensions. These could be disturbed however impacts to ASS are considered low and manageable:

- The nature of the works involving shoulder widening will result in fill be required rather than excavations.
- Dewatering or lowering of the water table is unlikely to be required. Works will be undertaken where possible during the 'dry' season when the water table is lower than the areas to be excavated.
- At each culvert extension point, impacts will disturb less than 100 m^3. If soils over 100 m^3 need to be excavated below the water table at any one location, a preliminary ASS investigation may be required. If not, but excavations are required over 100 m^3 then excavated materials can be stockpiled on site, and the pH tested. If required, agricultural lime can be mixed through the excavated soils with the machinery on site (i.e. to neutralise the soil), and then formally verified via resampling until an appropriate pH is achieved. Soils can then be reused on site (DER 2015).
- ASS PEMRs will be included in the CEMP.

There are no contaminated sites within two kilometres of the project (Main Roads' shapefiles 2021).

A Dieback Assessment was not commissioned due to the lack of intact native vegetation and or indicator species across most of the project area. The project clearing is not located on the edge of any DBCA lands or protectable areas of native vegetation (uninfested areas >4ha in size). The site is considered dieback uninterpretable/unprotectable, and therefore not considered a high risk. The remaining LCSS work will be within the existing road formation and/or maintenance zone.

Due to the lack of protectable areas or adjacent DBCA land where clearing will take place the preparation of a detailed Dieback Management Plan is not considered necessary, however dieback management measures will be included in the CEMP including the requirements for machinery to be clean on entry and exit and records kept. A DBCA Dieback Risk Assessment From was not prepared as the project is not located adjacent to any DBCA land and due to the lack of adjacent protectable areas.

No other forms of land degradation are likely to arise from the project. The proposed clearing is not likely to cause appreciable land degradation.

Proposed clearing is not likely to be at **variance to this Principle**

Methodology
Aerial photography
EPA (2016)
DER (2015)
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Proposed clearing is not at **variance to this Principle**

The project is located adjacent to DBCA land - Hester State Forest, between 3.7 and 9.7 SLK. There is no clearing proposed adjacent to these areas. Works will be minor and contained within the M006 road reserve.

Proposed clearing is not likely to be at **variance to this Principle**

Methodology
Aerial photography
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Proposed clearing is not likely to be at **variance to this Principle**

Comments

The project will have negligible impact on local minor drainage lines or other water features. No major water courses cross the project.

The proposed clearing is not anticipated to impact on the quality of local surface water because localised roadside drainage will be managed through the project design including minor roadside drainage improvements and kerbing, including the extension of existing culverts. Where existing culverts are to be extended, rock protection will be included at adjacent outfalls. Also, where existing sections have steep longitudinal grades, rock protection will be included. This will control the velocity, minimise erosion damage and thus reduce solids in the water.

No dewatering or lowering of the water table will be required for the project. Further, the project does not involve works that could otherwise impact groundwater quality. Any use of potential contaminants (e.g. fuel) will adhere to Main Roads standard management actions.

The project is not located within any Public Drinking Water Source Areas or Surface Water Areas proclaimed under the RIWI Act (Main Roads 2021).

Overall, the proposed clearing is not likely to cause deterioration in the quality of surface or underground water.

Proposed clearing is not likely to be at **variance to this Principle**

Methodology
Aerial photography
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Proposed clearing is not at **variance to this Principle**

Comments
The existing drainage will be either maintained or improved. The project is not expected to alter drainage volumes in the local area. Consequently, the proposed clearing will not cause or exacerbate the incidence or intensity of flooding.

The proposed clearing is not at **variance to this Principle.**

Methodology
Aerial photography
EPA (2016)
Main Roads GIS Shapefiles
Main Roads Site Inspection (20/10/2021)

6 ADDITIONAL ACTIONS REQUIRED

The clearing associated with the proposal is unlikely or not at variance with the Clearing Principles. Additional management actions under CPS 818 are detailed in Table 6.

Table 6. Summary of Additional Management Actions Required by Permit CPS 818

Impact of Clearing	Yes/No or NA	*Further Action Required)*
1. The project involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
2 a. Project is within Region that: - Has rainfall greater than 400mm and - Is South of the 26th parallel and - Works are in 'Other than dry conditions' and - Works have potential for **uninfested** areas to be impacted	**Yes**	No clearing required adjacent to DBCA land, No clearing in 'Other than dry conditions', and No potential for uninfested areas to be impacted. Standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists will be applied.
3. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	**No**	No further action required. .
4. The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition	**No**	No further action required.

7 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum. Vegetation will be managed in accordance with the Principal Environmental Management Requirements (PEMR's).

8 REFERENCES

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9 APPENDICES

Appendix	Title
Appendix 1	Clearing locations (D21#1171325)
Appendix 2	DBCA Threatened Flora and Fauna Database Searches (D21#1171145)

Appendix 1: Clearing locations

D21#1171325

Appendix 2: DBCA Threatened Flora and Fauna Database Searches

D21#1171145